CLAIMS

What is claimed is:

1. A charge-coupled amplifier circuit, consisting of:

an analog-to-digital converter which uses a first voltage as a first reference to convert an analog input to a digital output, and which is also connected to receive a second reference voltage; and

a single-stage inverting amplifier which is connected to receive charge-coupled inputs, and to amplify said inputs with reference to said second voltage, and to drive said analog input accordingly.

2. The circuit of Claim 1, wherein said first and second voltages both differ from ground.

3. The circuit of Claim 1, wherein said first voltage differs from ground by a predetermined offset value.

4. The circuit of Claim 1, wherein said inverting amplifier is autozeroed during a precharge phase.

5. The circuit of Claim 1, wherein said inverting amplifier is a programmable gain amplifier.

6. The circuit of Claim 1, wherein said first voltage is proportional to said second reference voltage.

7. The circuit of Claim 1, wherein said inverting amplifier is a single supply, charge-coupled operational amplifier.

8. The circuit of Claim 1, wherein said charge-coupled inputs are supplied by a multiplicity of matched capacitors.

9. The circuit of Claim 1, wherein the voltages at respective said charge-coupled inputs are provided by corresponding outputs of active integrators connected to photosensitive elements.

10. An optical sensor array integrated circuit, comprising:
an array of photosensitive elements for sensing light energy; and
a charge-coupled amplifier circuit, consisting of
an analog-to-digital converter which uses a first voltage as a first reference to convert an analog input to a digital output, and which is also connected to receive a second reference voltage; and
a single-stage inverting amplifier which is connected to receive charge-coupled inputs, and to amplify said inputs with reference to said second voltage, and to drive said analog input accordingly.

11. The circuit of Claim 10, wherein said first voltage differs from ground by a predetermined offset value.

12. The circuit of Claim 10, wherein said inverting amplifier is autozeroed during a precharge phase.

13. The circuit of Claim 10, wherein the voltages at respective said charge-coupled inputs are provided by corresponding outputs of active integrators connected to said photosensitive elements.

14. The circuit of Claim 10, wherein said array is a substantially linear array.

15. A method for converting multiple single-ended ground-referenced charge signals to a digital representation, comprising the steps of:

(a.) converting an analog input to a digital output using an analog-to-digital converter which is referenced to a first voltage, and which is also connected to receive a second reference voltage; and

(b.) connecting a single-stage inverting amplifier to receive charge-coupled inputs, and to amplify said charge-coupled inputs with reference to said second voltage, and to drive said analog input accordingly.

16. The method of Claim 15, wherein said first voltage differs from ground by a predetermined offset value.

17. The method of Claim 15, wherein said inverting amplifier is autozeroed during a precharge phase.

18. The method of Claim 15, wherein said inverting amplifier is a programmable gain amplifier.

19. The method of Claim 15, wherein the voltages at said respective charge-coupled inputs are provided by corresponding outputs of active integrators connected to said photosensitive elements.

20. A method for digitizing charge-coupled inputs in an optical sensor array, comprising the steps of:

(a.) connecting one or more charge-coupled inputs from an array of photosensitive elements used for sensing light energy; and

(b.) amplifying said charge-coupled inputs with an amplifier circuit, said amplifier circuit consisting of

an analog-to-digital converter which uses a first voltage as a first reference to convert an analog input to a digital output, and which is also connected to receive a second reference voltage; and

a single-stage inverting amplifier which is connected to receive said charge-coupled inputs, and to amplify said inputs with reference to said second voltage, and to drive said analog input accordingly.

21. The method of Claim 20, wherein said first voltage differs from ground by a predetermined offset value.

22. The method of Claim 20, wherein said inverting amplifier is autozeroed during a precharge phase.

23. The method of Claim 20, wherein said inverting amplifier is a programmable gain amplifier.

24. The method of Claim 20, wherein the voltages at respective said charge-coupled inputs are provided by corresponding outputs of active integrators connected to said photosensitive elements.

25. The method of Claim 20, wherein said array is a substantially linear array.